

Claims

1. (Currently Amended) A method of compensating mask/reticle data for lithographic process distortions, comprising the acts of:

reading a set of mask/reticle data that defines at least one feature to be created lithographically;

performing an etch simulation of etch effects that would occur if a wafer is exposed using a mask/reticle corresponding to the set of mask/reticle data and etched with an etch process;

using results of the etch simulation to produce ~~an etch compensated~~a revised set of mask/reticle data that are compensated for the etch effects; and

performing optical process correction (OPC) to produce a set of OPC-corrected mask/reticle data that compensate for optical/resist process distortions using the ~~etch compensated~~revised set of mask/reticle data as an inputa target layer for the OPC.

2. (Previously Presented) The method of Claim 1, comprising an additional act of exporting the OPC-corrected set of mask/reticle data to a mask/reticle writer to manufacture a corresponding mask/reticle.

3. (Currently Amended) The method of Claim 1, in which the act of performing ~~at~~the etch simulation includes accessing a set of predetermined rules for the etch process.

4. (Currently Amended) The method of Claim 1, in which the act of performing ~~at~~the etch simulation includes accessing a table of predetermined values for the etch process.

5. (Currently Amended) A method of compensating mask/reticle data for lithographic process distortions, comprising the acts of:

reading an initial set of mask/reticle data that defines at least one feature to be created lithographically;

performing an etch simulation of etch effects that would occur if a wafer is exposed using a mask/reticle corresponding to the initial set of mask/reticle data and etched with an etch process;

calculating etch biases from results of the etch simulation; and

applying previously calculated the etch biases that are calculated from the initial set of mask/reticle data within a model-based optical process correction (OPC) loop that adjusts the mask/reticle data for optical/resist process distortions.

6. (Currently Amended) The method of Claim 5, in which the act of performing at the etch simulation includes accessing a set of predetermined rules for the etch process.

7. (Currently Amended) The method of Claim 5, in which the act of performing at the etch simulation includes accessing a table of predetermined values for the etch process.

8. (Currently Amended) A computer-readable media having a sequence of programmed instructions stored thereon that when executed by a computer causes the computer to perform the acts of:

reading a set of mask/reticle data that defines at least one feature to be created lithographically;

performing an etch simulation of etch effects that would occur if a wafer is exposed using a mask/reticle corresponding to the set of mask/reticle data and etched with an etch process using the results of the etch simulation to produce an etch compensated a revised set of mask/reticle data that are compensated for the etch effects; and

performing optical process correction (OPC) to produce a set of OPC-corrected mask/reticle data that compensate for optical/resist process distortions using the etch compensated revised set of mask/reticle data as an input a target layer for the OPC.

9. (Previously Presented) The computer-readable media of Claim 8, wherein the sequence of programmed instructions causes the computer to export OPC corrected mask/reticle data to a mask/reticle writer to manufacture a corresponding mask/reticle.

10. (Currently Amended) The computer readable media of Claim 8, in which the act of performing at the etch simulation includes accessing a set of predetermined rules for the etch process.

11. (Currently Amended) The computer readable media of Claim 8, in which the act of performing at the etch simulation includes accessing a table of predetermined values for the etch

process.

12. (Currently Amended) A computer readable media having a sequence of programmed instructions stored thereon that when executed by a computer causes the computer to perform the acts of:

- reading an initial set of mask/reticle data that defines at least one feature to be created lithographically;
- performing an etch simulation of etch effects that would occur if a wafer is exposed with a mask/reticle corresponding to the set of initial mask/reticle data and etched with an etch process;
- calculating etch biases from results of the etch simulation; and
- applying previously calculated the etch biases that are calculated from the initial set of mask/reticle data in a model-based optical process correction (OPC) loop that adjusts the mask/reticle data for optical/resist process distortions.

13. (Currently Amended) The computer readable media of Claim 12, in which the act of performing at the etch simulation includes accessing a set of predetermined rules for the etch process.

14. (Currently Amended) The computer readable media of Claim 12, in which the act of performing at the etch simulation includes accessing a table of predetermined values for the etch process.

Claims 15-19. (Cancelled)

20. (Currently Amended) A device that is formed on a wafer created by the acts of:
reading a set of mask/reticle data that defines at least one feature to be created lithographically;
performing an etch simulation of etch effects that would occur if a wafer is exposed using a mask/reticle corresponding to the set of mask/reticle data and etched with an etch process;
using results of the etch simulation to produce an etch compensated a revised set of mask/reticle data that are compensated for the etch effects;
performing optical process correction (OPC) to produce OPC-corrected mask/reticle data that

are compensated for optical/resist process distortions using the ~~etch-compensated~~revised set of mask/reticle data as an inputa target layer for the OPC;

exporting the OPC-corrected set of mask/reticle data to a mask/reticle writer to manufacture a corresponding mask/reticle; and

using the mask/reticle to create the device on the wafer.

21. (Currently Amended) The device of Claim 20, in which the act of performing ~~at~~the etch simulation includes accessing a set of predetermined rules for the etch process.

22. (Currently Amended) The device of Claim 20, in which the act of performing ~~at~~the etch simulation includes accessing a table of predetermined values for the etch process.

23. (Currently Amended) A device that is formed on a wafer created by the acts of:
reading an initial set of mask/reticle data that defines at least one feature to be created lithographically;

performing an etch simulation of etch effects that would occur if a wafer is exposed using a mask/reticle corresponding to the initial set of mask/reticle data and etched with an etch process;

calculating etch biases from results of the etch simulation;

applying ~~previously calculated~~the etch biases that are calculated from the initial set of mask/reticle data within a model-based optical process correction (OPC) loop that adjusts the mask/reticle data for optical/resist process distortions;

exporting the adjusted mask/reticle data to a mask/reticle writer to create a corresponding mask/reticle; and

using the mask/reticle to create the device on a wafer.

24. (Currently Amended) The device of Claim 23, in which the act of performing ~~at~~the etch simulation includes accessing a set of predetermined rules for the etch process.

25. (Currently Amended) The device of Claim 23, in which the act of performing ~~at~~the etch simulation includes accessing a table of predetermined values for the etch process.

26. (Currently Amended) The method of Claim 1, wherein the etch simulation determines

an increase in size of a feature that would be created on a wafer compared with a target feature size as a result of the etch process and a corresponding feature in the ~~etch-compensated~~revised set of mask/reticle data is biased with a corresponding decrease in size.

27. (Currently Amended) The method of Claim 1, wherein the etch simulation determines a decrease in size of a feature that would be created on a wafer compared with a target feature size as a result of the etch process and a corresponding feature in the ~~etch-compensated~~revised set of mask/reticle data is biased with a corresponding increase in size.

28. (Currently Amended) The computer readable media of Claim 8, wherein the instructions further cause the computer to determine an increase in size of a feature that would be created on a wafer compared with a target feature size as a result of the etch process and a corresponding feature in the ~~etch-compensated~~revised set of mask/reticle data is biased with a corresponding decrease in size.

29. (Currently Amended) The computer readable media of Claim 8, wherein the instructions further cause the computer to determine a decrease in size of a feature that would be created on a wafer compared with a target feature size as a result of the etch process and a corresponding feature in the ~~etch-compensated~~revised set of mask/reticle data is biased with a corresponding increase in size.

30-31. (Cancelled)